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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Artie R. Conner

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IPSOLON LLP
805 SW BROADWAY, #2740
PORTLAND, OR 97205

EXAMINER

NGUYEN, HOAN C

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 09/06/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/681,184

Applicant(s)

CONNER ET AL.

Examiner

HOAN C. NGUYEN

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features:

- “the (post-display panel?) dynamic displacement element includes a pair of face-to-face refractive elements with a separation between them that is modified to successively direct the color-component sub-pixels generated by the display panel along different optical paths” in claim 11;
- “a color separating element for providing the color separation of incident multi-color illumination light and a prism array positioned after the color separating element” in claim 13;
- “the each microlens is aligned with and delivers light to a triplet of color-component sub-pixels that are arranged that are positioned among two adjacent horizontal rows” in claim 18;
- “the dynamic displacement element includes a pair of face-to-face refractive elements with a separation between them that is modified to successively direct the color-component sub-pixels generated by the display panel along different optical paths” in claim 29;
- “an angularly color separating incident multi-color illumination light to provide the color-separated color components: in claim 34;

- “the display panel includes color component sub-pixels that are arranged in vertical columns for each color component and dynamically aligning the color-component sub-pixels after the display element includes displacing selected color components laterally” in claim 37
- “the color-component sub-pixels of a pixel are arranged on the display panel in adjacent rows and dynamically aligning the color-component sub-pixels after the display element includes displacing selected color components in transverse directions” in claim 38
- “a color display system with plural pixellated electronic display panels that each receive illumination of a different color component of light and a combiner that combines color component light images formed by the display panels, the improvement comprising: a post-combiner dynamic displacement element that displaces alignment of the color-component sub-pixels generated by the display panel to form a resolution -enhanced display image” in claim 39;

must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claims 1-14 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 19-32 since "a color display system" and "a color electronic display projector" consider as preamble. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claims 10-11, 28-29, 33 and 39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The following limitations

- "the rotating element" includes a plural refractive" in claims 10 and 28;
- "the dynamic displacement element" in claims 11 and 29;
- "after the display element" in claim 33;
- "formed by the display panels" in claim 39.

are lack antecedent basis.

2. Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such

omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: "dynamically aligning the color-component sub-pixels after the display element" by what elements.

3. Claims 34 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: an angularly color separating incident multi-color illumination light to provide the color-separated color components.

4. Claim 37 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 37 recites the limitation "the display panel includes color component sub-pixels that are arranged in vertical columns for each color component and dynamically aligning the color-component sub-pixels after the display element includes displacing selected color components laterally". Examiner fails to understand the process of "after the display element includes displacing selected color components laterally". This claim also has omitted the structure cooperative relationships of elements to provide this process.

5. Claim 38 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 37 recites the limitation "the color-component sub-pixels of a pixel are arranged on the display panel in adjacent rows and dynamically aligning the color-component sub-pixels after the display element includes displacing selected color components in transverse directions". Examiner fails to understand the process of "after the display element includes displacing selected color components in transverse directions." This claim also has omitted the structure cooperative relationships of elements to provide this process.

6. Claim 39 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: a post-combiner dynamic displacement element that displaces alignment of the color-component sub-pixels generated by the display panel to form a resolution -enhanced display image."

Furthermore, the limitation "In a color display system with plural pixellated electronic display panels" should be "in a color display system with plural-pixel electronic display panel."

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-3, 13-18, 19-21 and 31-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Loiseaux et al. (US5467206A).

In regard to claims 1-3, 15-18 and 19-21, Loiseaux et al. teach (Figs. 8 and 5b) a color display system comprising:

- an illumination system C that provides fixed, color-separated illumination of color-component sub-pixels in a pixellated electronic display panel LCD; wherein the display panel includes color component sub-pixels that are arranged in vertical columns for each color component and successive sub-pixels in each column are positioned in alternate successive rows (Fig. 2a) according to claims 15-18.
- a post-display panel dynamic displacement element (field lens) that displaces alignment of the color-component sub-pixels SR/SB/SG generated by the display panel (as shown in Fig. 1).
- an angular color separation system (chromic separator element RC) with plural angularly inclined dichroic mirrors (Fig. 5b) for providing the color separation of incident multi-color illumination light according to claim 2.

- a microlens array positioned adjacent the pixellated electronic display according to claim 3; wherein a microlens array positioned adjacent the display panel, wherein the each microlens is aligned with and delivers light to a triplet of color-component sub-pixels that are arranged in a horizontal row (Fig. 2a) according to claim 16.

In regard to claim 1, 13-14 and 19, 31-32, Loiseaux et al. teach (Figs. 8 and 5b) a color display system comprising:

- an illumination system 12 that provides fixed, color-separated illumination of color-component sub-pixels in a pixellated electronic display panel (LCD 48);
- a post-display panel dynamic displacement element (light directing means 44) that displaces alignment of the color-component sub-pixels 46 generated by the display panel;
- a color separating element 40 for providing the color separation of incident multi-color illumination light and a prism array the light redirecting means 44) positioned after the color separating element; wherein color separating element includes an angular color separation system with plural angularly inclined dichroic mirrors (as Fig. 5b shown one type of color separating element using in invention).

2. Claims 1, 3-7, 19, 21-25 and 39 are rejected under 35 U.S.C. 102(b) as being anticipated by Steiner et al. (US5748828A).

In regard to claims 1, 3-7 and 19, 21-25, Steiner et al. teach (Figs. 3) a color display system comprising:

- an illumination system 12 that provides fixed, color-separated illumination of color-component sub-pixels in a pixellated electronic display panel (LCD 48);
- a post-display panel dynamic displacement element (light directing means 44) that displaces alignment of the color-component sub-pixels 46 generated by the display panel;
- a microlens array (collimation structure 22) positioned adjacent the pixellated electronic display;
- a grating (color separating optical element 40) positioned between the microlens array and the pixellated electronic display according to claim 4, wherein the grating with holographic optical elements include holographic grating according to claim 7 (col 5 lines 29-35).

In regard to claim 39, Steiner et al. teach (Figs. 3) a color display system with plural pixellated electronic display panels that each receive illumination of a different color component of light and a combiner (the light redirecting means 44) that combines color component light images formed by the display panels, the improvement comprising: a post-combiner dynamic displacement element (the light redirecting means 44) that displaces alignment of the color-component sub-pixels generated by the display panel to form a resolution -enhanced display image (col. 4 lines 9-11).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 8-10 and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loiseaux et al. (US5748828A) as applied to claims 1 and 19 in view of Doany et al. (US5984478A).

Doany et al. teach (Fig. 3B) the dynamic displacement element (the polarization retardation wheel 322) includes a rotating element (wave plate segments 332a-c) that successively directs the color-component sub-pixels generated by the display panel along different optical paths, wherein the rotating element includes a birefringent element with a selected polarization direction with a plural refractive segments (wave plate segments) having different inclination orientations for minimizing the residual polarization transmitted by light valve for each of the different color lights (col. 2 lines 37-40)..

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a color system as Loiseaux et al. disclosed with the dynamic displacement element includes a rotating element that successively directs the color-component sub-pixels generated by the display panel along different optical paths, wherein the rotating element includes a birefringent element with a selected polarization direction with a plural refractive segments having

different inclination orientations for minimizing the residual polarization transmitted by light valve for each of the different color lights.

4. Claims 11-12 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loiseaux et al. (US5748828A) as applied to claims 1 and 19, in view of Hanano et al. (US5661603).

Hanano et al. teach (Fig. 1) the dynamic displacement element includes a pair of face-to-face refractive elements (prism arrays 13 and 14) with a separation between them that is modified to successively direct the color-component sub-pixels generated by the display panel along different optical paths for enlarging the exist pupil diameter (col. 3 lines 37-40).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a color system as Loiseaux et al. disclosed with a pair of face-to-face refractive elements (prism arrays 13 and 14) with a separation between them that is modified to successively direct the color-component sub-pixels generated by the display panel along different optical paths for enlarging the exist pupil diameter.

5. Claims 33-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loiseaux et al. (US5748828A) as applied to claims 1 and 19 in view of Doany et al. (US5984478A).

Loiseaux et al. teach (Figs. 8 and 5b) a color display method comprising

- illuminating color-component sub-pixels in a pixellated electronic display panel LCD with color-separated, fixed color components RC;
- aligning the color-component sub-pixels with filed lens after the display element
- an angularly color separating incident multi-color illumination light to provide the color-separated color components.

wherein the display panel includes color component sub-pixels that are arranged in vertical columns for each color component and panel in adjacent rows and after the display element includes displacing selected color components in lateral and transverse directions as Fig. 2a shown according to claims 37-38.

However, Loiseaux et al. fail to disclose a color display system with a process of dynamically aligning the color-component sub-pixels after the display element.

Doany et al. disclose (Fig. 3B, col. 7 lines 22-59) that the color is generated by a conventional method with the color wheel, and dynamically aligning the color segments in the color wheel by the dynamical polarization retardation wheel 322. In another conventional method, color is created in color-component sub-pixel in a pixellated electronic display panel with color separation, thus it is obvious that a color display method with dynamically aligning the color-component sub-pixels after the display element with the dynamical polarization retardation wheel to synchronize the color-component sub-pixels (color filters) for optimizing for each color display (col. 2 lines 5-8).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify a color system as Loiseaux et al. disclosed with dynamically aligning the color-component sub-pixels after the display element with the dynamical polarization retardation wheel to synchronize the color-component sub-pixels (color filters) for optimizing for each color display.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Perlo et a. (US6262786B1) disclose device with micro-filters and micro-choppers for dynamic selection of color and images.

Lishikawa et al. (US6020940A) disclose liquid crystal projector with lens array moving mechanism.

Stoeckner (US5253000A) discloses device for projecting a moving image formed of light, shadow and color.

Ozeki et al. (US5953090A) disclose a reflection type color liquid crystal display apparatus comprising a prism array or a lenticular lens is disposed at the side of the observer so as to obtain a display having a wide viewing angle.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HOAN C. NGUYEN whose telephone number is (703) 306-0472. The examiner can normally be reached on MONDAY-THURSDAY:8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, SIKES L WILLIAM can be reached on (703) 308-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-8178 for regular communications and (703) 308-5841 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0530.

HOAN C. NGUYEN
Examiner
Art Unit 2871

chn
August 27, 2002



James Doherty